

**WHAT IS CLAIMED IS:**

1. A therapeutic composition, comprising:
  - a) a fusion polypeptide comprising a polypeptide which specifically binds CD38 or a portion thereof linked to a polypeptide which specifically binds DNA or a portion thereof; and
  - b) a DNA sequence encoding a cytotoxic agent which is operably linked to a cell- or tissue-specific transcriptional unit.
2. The composition of claim 1 wherein the polypeptide which specifically binds CD38 is an antibody.
3. The composition of claim 2 wherein the antibody is obtained from an antibody secreted by hybridoma HB7.
4. The composition of claim 1 wherein the polypeptide which specifically binds DNA is protamine.
5. The composition of claim 1 wherein the cytotoxic agent is diphtheria toxin A chain, a cell suicide protein, Pseudomonas exotoxin, or an enzyme or protein that activates a chemotherapeutic agent.
6. The composition of claim 1 wherein the transcription unit is specific for B cells.
7. The composition of claim 1 wherein the transcription unit is specific for T cells.
8. The composition of claim 1 wherein the transcription unit is specific for myeloid cells.
9. The composition of claim 2 wherein the antibody is a humanized antibody.

10. The composition of claim 1 further comprising a radioisotope linked to the fusion polypeptide.
11. The composition of claim 2 or 9 wherein the antibody is a scFv antibody.
12. An isolated and purified fusion polypeptide comprising at least a portion of a polypeptide that specifically binds CD38 and at least a portion of a polypeptide that specifically binds DNA.
13. A method to inhibit the growth of CD38+ cells, comprising contacting cells *in vitro* with an effective amount of the composition of claim 1.
14. An isolated and purified nucleic acid molecule comprising a nucleic acid segment encoding the fusion polypeptide of claim 12.
15. A method to inhibit or treat multiple myeloma, primary amyloidosis, monoclonal gammopathy, or acute myeloid leukemia, comprising: administering to a mammal in need of said treatment an effective amount of the composition of claim 1.
16. A recombinant DNA molecule which encodes a single chain fusion polypeptide, wherein the recombinant DNA molecule comprises:
  - a) a DNA sequence that encodes the Fv region of a light chain of an antibody specific for CD38 and the Fv region of a heavy chain of an antibody specific for CD38, wherein the fusion protein binds to CD38<sup>+</sup> cells; and
  - b) a DNA sequence that encodes a polypeptide that specifically binds DNA.
17. A recombinantly produced single chain fusion polypeptide comprising:
  - a) the Fv region of the light and the heavy chain of a CD38 specific antibody; and

- b) a DNA binding polypeptide, wherein the Fv region and the DNA binding polypeptide are recombinantly fused to form a single chain polypeptide that specifically binds CD38<sup>+</sup> cells.
18. A pharmaceutical composition comprising a recombinantly produced single chain fusion polypeptide in a concentration sufficient to inhibit tumor cell growth, together with a pharmaceutically acceptable carrier wherein the fusion polypeptide comprises:
- a) a single chain Fv region of an antibody, wherein the Fv region comprises the V<sub>H</sub> and V<sub>L</sub> regions of the antibody; and
  - b) a DNA binding polypeptide, wherein the Fv region and the DNA binding polypeptide are recombinantly fused to form a single molecule that specifically binds CD38<sup>+</sup> cells.